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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/640,962	08/16/2000	Earl A. Hubbell	3246.1	3721

7590

07/17/2002

Chief IP Counsel - Legal Dept  
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EXAMINER

ALLEN, MARIANNE P

ART UNIT      PAPER NUMBER

1631

DATE MAILED: 07/17/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	09/640,962	HUBBELL, EARL A.	
	Examiner	Art Unit	
	Marianne Allen	1631	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04/22/02.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) 4-21 and 25-40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 22-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2</u> . | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election without traverse of Group I, claims 1-3 and 23-24, in Paper No. 4 is acknowledged.

It is noted that the restriction requirement inadvertently omitted claim 22 in Group I. Claims 1-3 and 22-24 are under consideration by the examiner.

Claims 4-21 and 25-40 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Election was made **without** traverse in Paper No. 4.

### ***Claim Rejections - 35 USC § 112***

Claims 1-3 and 22-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-3 are directed to computer implemented method for arranging polymers and claims 22-24 are directed to the corresponding computer software product.

However, the claims as written omit essential elements or steps. See MPEP § 2172.01.

For example, the method as written does not clearly require that one obtain an ordered list of polymers to be used as input for optimization and that the optimization is with respect to reducing edge count. The step of reducing edge count does not in and of itself reach the final result of the preamble of producing an arrangement of polymers on a substrate. The claims do not make clear what is considered an edge count. Is the edge count of the claim with respect to

the substrate (a physical edge) and/or the ordered list of polymers (a computational edge)? The claims do not make clear what is considered to be a reduction. That is, it does not appear that every edge count will be reduced in an optimization. The claims do not set forth exactly what must be performed for optimization or what is optimized. Recitation of “traveling salesman optimization” or “locally greedy insertion heuristic” does not clearly set forth in the claim what is to be done (what is the input, what is the output, assumptions or other parameters with respect to iterations) to implement the method. Note that the specification discloses assigning spatial locations for synthesis of the polymers and then reducing edge count between synthesis sites to reduce errors. That is, the assignment of the spatial locations is changed according to a particular algorithm. It is further noted that the type of synthesis (light-directed chemical coupling, mechanical coupling) is omitted in the claims and this will affect the optimization. What is optimal for one type of synthesis may not be optimal for another.

With respect to “locally greedy insertion heuristic” it is unclear what the metes and bounds of this phrase is. While the specification discusses a particular algorithm (see pages 16-18 and Figure 3) it is unclear whether the claims are limited to this embodiment, and if not, what other algorithms may be encompassed. Note that none of the claims have limitations to blocks making the claims confusing.

Applicant is reminded that while one of ordinary skill in the art reads the claims in view of the specification, one cannot incorporate limitations from the specification into the claims.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Hubbell et al. (U.S. Patent No. 5,593,839).

Hubbell et al. discloses a computer implemented method for arranging nucleic acid polymers synthesized on a chip and a computer software product therefore. See abstract, figures, and claims. In designing the synthesis method and layout of the chip, the method and software include steps to adjust the series of monomer additions to reduce the number of monomer additions that differ between at least two adjacent synthesis regions. (See at least column 2, lines 59-63; column 5, lines 17-23; column 9, line 39, through column 10, line 34.) This meets the limitation of reducing edge count as defined in the specification. The input is sequence information which meets the limitation of an ordered list of polymers.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hubbell et al. (U.S. Patent No. 5,593,839) in view of the specification at pages 13-15.

Hubbell et al. is applied as above. The reference does not specifically disclose using traveling salesman optimization or locally greedy insertion heuristics. However, as set forth in the specification these would have been well known computational techniques for solving the

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type of design problem addressed by Hubbell et al. as set forth above. As such, one would have been motivated to use these well known techniques in the method and computer software product of Hubbell et al. in order to result in the claimed invention. One would have been motivated to do so for the benefits of chip design and synthesis as discussed by Hubbell et al. for reduced edge counts.

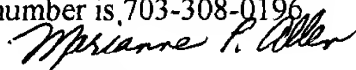
### *Conclusion*

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marianne P. Allen whose telephone number is 703-308-0666. The examiner can normally be reached on Monday-Friday, 7:00 am - 1:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward can be reached on 703-308-4028. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3014 for regular communications and 703-305-3014 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

  
Marianne P. Allen  
Primary Examiner  
Art Unit 1631

mpa  
July 15, 2002.